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09/695,028	10/24/2000	Jason Michael Benz	BUR9-2000-0047-US1	3674

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EXAMINER

ALANKO, ANITA KAREN

ART UNIT PAPER NUMBER

1765

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/695,028

Applicant(s)

BENZ, JASON MICHAEL

Examiner

Anita K Alanko

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/30/03 amdt "d".
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The new matter is the phrase "wherein the etch relation is determined by a rate of a metal oxide etch". The specification has basis for using the selectivity to determine the etch relation (page 9, lines 1-7). The selectivity is the ratio of etch rates, not just a single etch rate. This rejection is also be a scope of enablement rejection, in that there is basis for using an etch rate ratio (page 9, lines 1-7), but not for using a single etch rate (as in claim 1, last line), to determine an etch relation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-39 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chapple-Sokol et al (US 5,465,859).

Chapple-Sokol discloses a method of etching a substrate, comprising:

- measuring a reflectance signal from a reflective material 7 deposited on said substrate 8 as the substrate is being etched (Fig. 1f, col.3, lines 24-26);
- correlating the substrate etch rate to the reflectance signal from the reflective material; and
- using the etch relation between the substrate and the reflective material to determine the etch target,
- wherein said reflective material 7 is isolated from an etching process (by mask 9, an oxide, and by chrome's native oxide, Fig. 1b), and
- wherein the etch relation is determined by a rate of a metal oxide etch (the rate at which silicon oxide 13 clears).

As to claim 8, 18 and 29, the reflectance signal does not physically represent the substrate or primary film being etched. The reflective material 7 is metal (chrome), and since Chapple-Sokol does not disclose extra steps to prevent the formation of native oxide, the native metal oxide is expected to inherently be present.

As to claims 34-36, there is an inherent direct correlation between the reflectance of the oxide 9 and the substrate etch rate since Chapple-Sokol determines the endpoint of the process based on when the oxide 9 has cleared.

Allowable Subject Matter

Claims 40-42 are objected to as being dependent upon a rejected base claim, but would be allowable over the prior art if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

The objection to the specification is withdrawn. The claims are rejected under 35 U.S.C. § 112, first paragraph. Claims 1-39 are also rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chapple-Sokol et al (US 5,465,859). Claims 40-42 would be allowable over the prior art in independent form, see note below. The drawing corrections filed June 30, 2003 are approved.

Applicant argues that Chapple-Sokol does not disclose a metal oxide layer. However, silicon oxide is considered a metal oxide by those with ordinary skill in the art. A rate at which the oxide clears is used in the method of Chapple-Sokol. Chapple-Sokol does not use a discrete value of the etch rate, rather a relation between the etch rate of the oxide and the substrate etch rate. Thus, Chapple-Sokol is "using" the etch rate as broadly interpreted.

The following amendments would make this application allowable. An attempt was made to call the applicant on August 22, 2003, but was not successful. The following would provide for proper antecedent basis for all terms in the claims and to incorporate the limitations of claim 40 into claim 1. Basis for the changes can be found in the specification at page 9, lines 1-7. Similar changes would need to be made for the other independent claims, claims 12 and 23.

Claim 1. A method of etching a substrate, comprising:

providing a substrate comprising a reflective material deposited on said substrate and a metal oxide deposited on said reflective material;

etching said substrate to an etch target and etching said metal oxide;

measuring a reflectance signal from [[a]] said reflective material deposited on said substrate as the substrate is being etched;

correlating the selectivity of the substrate etch rate and the metal oxide etch rate to the reflectance signal from the reflective material, thereby obtaining an etch relation; and

using the etch relation between the substrate and the reflective material to determine the etch target,

wherein said reflective material is isolated from [[an]] the etching process by the metal oxide layer, and

wherein ~~the etch relation is determined by a rate of a metal oxide etch~~ said etch target is determined before said metal oxide is completely removed.

Claim 37. The method of claim 1, wherein a change in a measurement of said reflectance signal ~~is determined by a rate of said metal oxide etch~~ correlated to the metal oxide etch depth.

Cancel claims 40-42.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday-Wednesday and Friday, 8:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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Anita K. Alanko

Anita K Alanko

Primary Examiner

Art Unit 1765

AKA

August 22, 2003